

3.4: Discussion

Write a minimum one-page (12 font, single spaced) discussion on the experiment conducted this week. Address **at least one question in each category** as fully as possible integrating the collected data, providing explanations for the observed trends and evaluating whether your original assumptions about the experiment were validated by the results. **The assignment will be graded on completeness, clarity of the explanations and the meaningful integration of the collected and calculated data.** Correct grammar and appropriate format for the chemical formulae and chemical reactions is expected. **You may use the outline included at the end of this document on how to build your essay to address each category.**

1. (Existing knowledge, research, and views) Describe the difference between saturated and supersaturated solutions.
2. (Existing knowledge, research and views) Classify alum as an ionic or molecular compound and describe the crystal structure of alum.
3. (Lab skill) Describe the process involved in starting the crystal growth project and provide a purpose for each step.
4. (Analysis) Describe what characteristics of the seed crystals you considered when selecting the most suitable crystals for this project. Provide at least one supported argument to justify your selection process.
5. (Lab skill) Estimate the approximate size of a seed crystal that would be useful to grow a large single crystal from.
6. (Analysis) Provide at least one supported argument for using a saturated solution to grow the single crystal from the seed crystal.
7. (Assumptions) A seed crystal is submerged in a solution and disappears. What assumption can we make about the solution?
8. (Analysis) Describe what happens with the saturated alum solution that causes the growth of the single crystals from the seed crystals.
9. (Analysis) Provide at least two supported arguments for starting the crystal project with two seed crystals submerged in the grow solution.
10. (Analysis) Your seed crystal should be suspended by a thread in the grow solution, instead of remaining in the Petri dish. Provide a supported argument for why this transition is necessary.
11. (Lab skill) Describe the process of monitoring and maintaining the large single crystal.
12. (Assumptions) Each time the alum single crystal is maintained, it needs to be rinsed thoroughly with distilled water before being placed into the filtered grow solution. What assumption are we making about the crystal that makes this approach necessary?
13. (Analysis) Alum is soluble in water. Why doesn't the crystal dissolve when it is washed with water?

Recommended outline

Alum is a(n) compound which means that in the solid state are held together by and form structures.

A solution is saturated when And it is supersaturated when When growing our crystal starting with the alum seed crystal, we could tell that the solution was saturated when and supersaturated when

Setting up for the growing of the large single crystal from seed requires the following steps: In the first step we because..... (continue for each step). A suitable seed crystal is one that and has approximately size. These are important considerations because

When submerging the seed crystal in the grow solution, we want the grow solution to be because If our crystal were to disappear, we would assume If there are lots of crystals growing in our solution, we would assume

When a saturated solution is left outside, the water will..... and this will cause the solution to become These changes will cause the crystal We use two seed crystals for this experiment because

When growing the large crystal, we suspend the seed crystal from a thread in the middle of the grow solution because When monitoring the growth of single crystals we look for and if then We are rinsing the crystals each time we extract them from the solution based on the assumption that the crystals will which will result in We are able to rinse our crystals in distilled water without them disappearing because

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